March 16, 1943. E. P. SUNDHOLM 2,313,845

LUBRICANT DISPENSING DEVICE

Filed Sept. 16, 1940

Fig. 2.

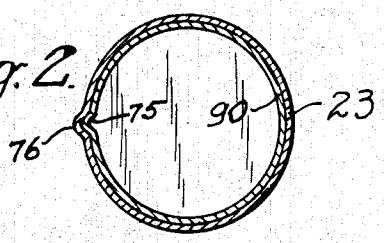


Fig. 4.

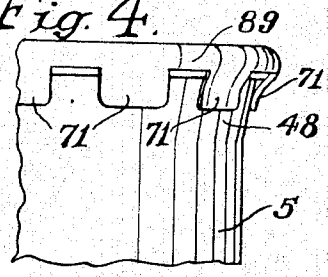


Fig. 1.

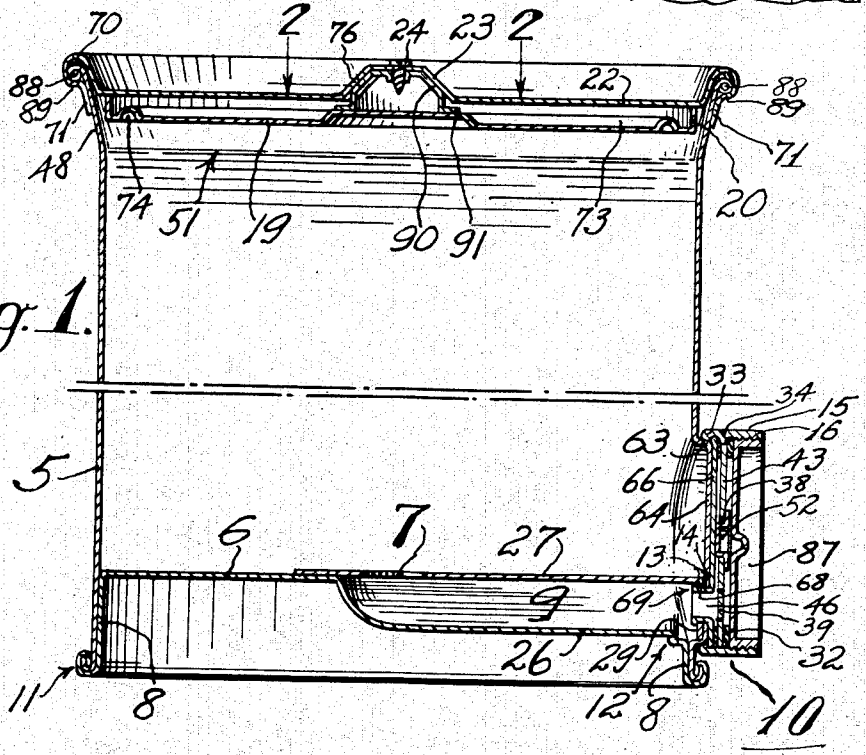
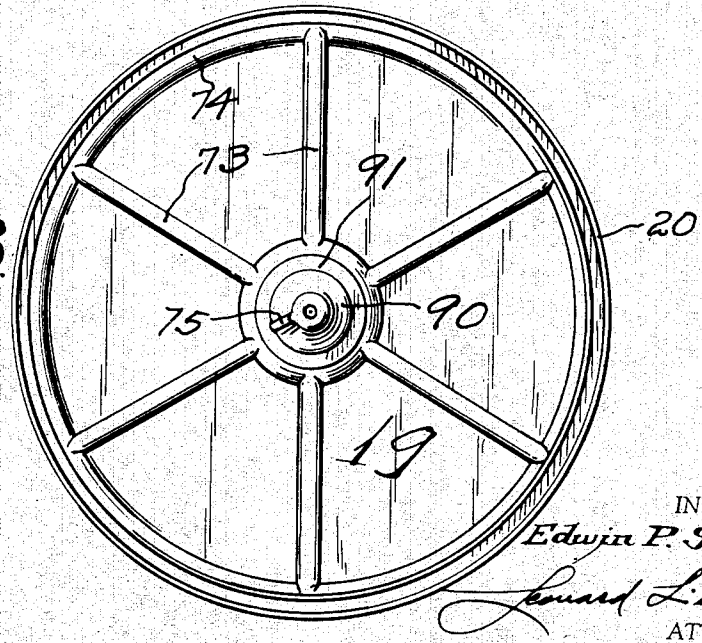


Fig. 3.



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LUBRICANT DISPENSING DEVICE

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3 Claims. (Cl. 221—47.5)

The present invention relates to certain new and useful improvements in dispensing devices for filling grease-guns and the like, of the general type forming the subject matter of my copending applications, Serial Nos. 236,281, filed October 21, 1938 (which matured into United States Patent No. 2,214,779 on September 17, 1940; 303,655, filed November 9, 1939; 319,386, filed February 17, 1940 (which matured into United States Patent No. 2,266,827 on December 23, 1941); and 303,658, filed November 9, 1939 (which matured into United States Patent No. 2,239,581 on April 22, 1941).

One of the objects of the present invention is to render the grease dispensing devices of the character stated, more dependable and to free them of a certain hazard heretofore obtaining.

Thus, in handling and shipping the empty devices prior to being filled with grease or lubricant or the like, as well as in handling, shipping and storing these devices after they are filled with grease or the like, but prior to ultimate use, there is a tendency to loosen the follower-plate from the lid and thus to drop the follower-plate from the supporting screw extending through the lid, to the bottom of the device. This is occasioned by repeated jarring and handling because the follower-plate is more or less free to revolve. If the follower-plate is so loosened and dropped to the bottom before filling, then there is the hazard of the filling operator filling the grease into the can on top of the follower, thereby rendering the follower-plate useless, and if the defect is noticed in time, it still involves an extra operation of inverting the device and shaking the follower-plate out of the device and then screwing it into place on the lid. If the follower-plate is so detached from the lid after the device has been filled with grease, but while the device is still in storage or transit and prior to being put into use, then there is a tendency for the grease to come over the top surface of the follower-plate and for the follower-plate to be tilted edge-wise and perhaps to sink edge-wise more or less through the body of the grease, thus rendering the follower-plate ineffective.

The object of the present invention is to minimize if not indeed to eliminate this hazard.

With the above object in view, the present invention consists of a novel form of construction in the lid or upper wall of the container and in the piston-like follower member, whereby such mechanical interlock or inter-engagement is obtained between the two as to prevent the relative rotation of one with respect to the other while held in close proximity to each other by the retaining screw which extends through the vent dome of the lid. The present invention further consists of other features and details of construction as will appear more fully from the following detailed description.

For the purpose of illustrating the invention, there is shown in the accompanying drawing one form thereof which is at present preferred, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangements and organizations of the instrumentalities as herein shown and described.

Figure 1 represents a vertical cross-sectional view of the grease dispensing device embodying the present invention, with part of it broken away so as to reduce the vertical height of the figure, and shown in the condition in which the device is shipped and stored and prior to actual use.

Figure 2 represents a section on line 2—2 of Figure 1.

Figure 3 represents a top elevational view of the follower.

Figure 4 represents a fragmentary side elevational view of the side of the container showing the serrated or "tabbed" peripheral edge of the lid.

The grease-dispensing device of the present invention includes a generally cylindrical body 5 of suitable diameter and height to provide the desired volumetric capacity, and a bottom 6 having an opening 7 preferably centrally thereof, although the opening may be off center and nearer to the point. For instance, for an effective twenty-five pound capacity the diameter of ten inches and a height of twelve inches is suitable, and so on.

The entire container may be formed of sheet metal, preferably suitable sheet-steel similar to that used for steel drums, and of a suitable gauge according to the size of the container, but preferably tempered or drawn to have some resiliency or springiness. The thicknesses shown in the drawing are exaggerated for purposes of more ready illustration. Other thin or lightweight form-retaining sheet-materials may be used, as for instance, hard, form-retaining fibrous (or non-fibrous) sheet materials suitably impregnated or otherwise compounded with grease and oil resistant ingredients.

The bottom 6 is preferably formed with a flange 8 of suitable depth to clear the lateral conduit 9 and gun-receiving socket 10 which will be described more fully hereinafter, thus forming a downwardly cupped member or inverted cup-shaped member. The flange 8 of the inverted cup-like bottom is of an external diameter such as to telescope into the lower end of the cylindrical body 5 and is preferably drawn from the same sheet of metal as that of which the bottom 6 is formed, as for instance, by being drawn in a die on a suitable press, or by any other suitable drawing or forming operation. The flange 8 may then be turned and folded and crimped or "double-seamed" along with the lower peripheral edge of the cylindrical body 5, to form a crimped and interlapping bead-like seam or "double-seam" 11 with the lower peripheral edge of the cylindrical body 5, which seam thus unites the flange 8 with the corresponding lower portion of the cylindrical body 5, and which, at the same time, secures the bottom 6 permanently in place in fluid-sealed relation to the body 5. The bottom 6 may also be held in place in a raised position by other means, as for instance, by welding it in place to the side-wall of the body 5 or by forming an outwardly pressed slight annular or peripheral groove in the body 5 at a suitable height above the lower extremity thereof into which the outer marginal portion of the bottom 6 may extend, to be held in place thereby. Likewise, the bottom 6 may have but a short downwardly extending flange which may be spot-welded to the side of the body 5.

In the preferred embodiment of the present invention, the transverse bottom conduit is formed by pressing suitable channel-shaped depression 26 out of the bottom 6 of the device, but integrally therewith, and then superimposing a flat plate 27 over said depression 26 and spot-welding it, fusing it, soldering it, or otherwise securing it to the bottom 6 along the marginal zone around the depression 26. In this preferred form of construction, the flat plate 27 may contain the central opening 7 as indicated in Figure 1, or the opening may be located off center but spaced inwardly from the side-wall 5 of the device. The opening 7 may also be formed by cutting the plate 27 shorter than the depression 26 so that the inner end of the depression 26 extends beyond the inner end of the plate 27.

A preferably circular boss 63 is pressed outwardly out of the side wall of the reservoir 5 in a zone partly above and partly below the level of the bottom 6 of the reservoir in the manner indicated particularly in Figure 1, said boss having a flat end wall 64.

Intermediate the outer end of the depressed channel 26 and the adjacent part of the depending flange 8 of the bottom of the reservoir, the metal is folded back upon itself as at 12, as indicated more particularly in Figure 1. The cover plate 27, which is secured (as for instance, by spot welding) to the bottom 6 along the marginal zone of the channel-shaped depression 26, is provided at its outer end with a downwardly depending skirt 29 the outermost portions of which are disposed adjacent to the periphery of the reservoir, while the central portion of which is extended outwardly to meet the inner surface of the flat part 64 of the boss 63. An elongated opening 13 is provided in the downwardly depending skirt 29 for alignment and registration with the corresponding opening 14 in the boss.

The gun-receiving ring 15 is preferably drawn and pressed out of sheet metal by punching die, although it may be formed out of metal tube as well, or it may be otherwise formed by casting or die-casting or the like.

The ring 15 may be internally screw-threaded as at 16, screw-threadedly to receive the screw-threaded end of the barrel of the grease-gun or like device.

The ring 15 is formed with an inturned annular flange 33 at one end. At a point spaced from the inturned flange 33, an inwardly projecting lug 34 is provided.

The circular base plate 66 is preferably a flat piece of sheet steel of suitable rigidity and has within it the elongated opening 46 corresponding to the openings 13 and 14 and the generally tubular crimping flange 68 drawn therefrom by a suitable punching die operation, the dimension and contour of the flange 68 being such as to fit neatly into the openings 14 and 13.

The diameter of the base plate 66 is such as neatly to fit within the inner clear diameter of the ring 15 with just sufficient clearance to permit the free rotation of the ring 15 about the outer circular periphery of the base plate 66.

The base plate 66 is then inserted into the ring 15 past the lug 34 thereof (by angling the plate 66) and, with the base plate 66 and ring 15 so assembled in relation to each other, the crimping flange 68 of the base plate 66 is inserted through the opening 14 in the boss-face 64 and through the opening 13 in the depending skirt portion 29 of the cover plate 27. This is done before the bottom 6 (with its flange 8 and channel 26) has been brought together with the cylindrical or body portion 5 of the reservoir, so that upon the insertion of the crimping flange 68 through the holes 14 and 13, the inner end of the crimping flange 68 may be flared over or crimped over as at 69 (see Figures 1, 2 and 3), thereby forming a fluid-tight seal from the passageway 9 (thereafter formed by combination with the channel 26) and the opening 46 in the base plate. The base plate 66 is also firmly secured to the boss-face 64 by spot-welding or riveting the two together at a suitable number of distributed points, so as to give the base plate 66 support against dislodgment independently of and without reliance upon the crimping sealing flange 68 thereof, or the two may be secured to each other by any other suitable means. In this position, the ring 15 is locked onto the boss 63 in a rotatable condition, with the inturned flange 33 of the ring 15 generally surrounding (with slight clearance) the circular boss 63 and being confined in an axial direction between the peripheral zone of the base plate 66 in an outward direction and the inner offset portion of the boss in an outward direction.

Thereupon, the bottom unit 6 including the flange 8 and the channel 26 is telescoped into the bottom of the body 5 of the reservoir and united thereto by the crimped annular seam 11. Thereafter, the plate 27 is secured to the bottom 6 by spot-welding, soldering, riveting in the marginal zone of the plate 27.

The rotatable disc 43 is of the same diameter as the stationary base plate 66. The disc 43 has a central pivot hole 38 and an off-center porthole 39 of the same general contour as the hole 46 in the base plate 66. The rotatable disc 43 is then inserted in place as indicated in Figures 1 and 2 with the lug 34 projecting into the notch

41, thereby to cause the ring 15 and disc 43 to rotate in unison.

A sheet metal pivot and fastening member 52, is inserted into the hole 38 of the rotatable disc 43 and welded in place onto the base plate 66 by spot-welding, soldering, riveting or otherwise securing at one or more welded, soldered or riveted points. This serves to lock the rotatable disc 43 in place without interfering, however, with its rotation.

The sealing gasket 32 is then inserted in the position shown in Figure 1.

Turning the ring 15, in one direction will cause a rotation of the ring 15 and of the disc 43 in the same direction until the hole 39 is in substantial registration with the hole 46 and the fluid may thus freely flow through the holes 46 and 39 into the socket 10. Reversed turning shuts the passage.

A plug 87 may be inserted into the ring 15 when the device is not in use, or when the device is in transit or storage.

The upper end of the cylindrical portion 5 of the reservoir device is preferably flared outwardly as at 48. The upper periphery of the reservoir is preferably beaded or flared as at 88. The lid 22 is preferably provided with a flange 89 crimped over the bead 88 of the body 5, thereby to secure the lid 22 more or less permanently to the body 5. An annular sealing gasket or other sealing means 70 is interposed between the crimped flange 89 of the lid 22 and the bead 88 of the body 5. The turn-over flange or crimp-flange 89 is preferably serrated along its marginal zone to provide tabs 71 which may be bent up to loosen the lid if desired.

The lid 22 is preferably provided with a raised portion or dome 23 pressed outwardly from the body of the lid 22, preferably to a height slightly greater than the uppermost peripheral portion of the lid. A hole is provided in the upper part of the raised portion 23 through which a screw 24 is adapted to extend. The follower plate 19 may be provided with a slight flange 20 of a diameter giving a slight clearance in relation to the inner diameter of the body 5 of the reservoir. To the upper surface of the follower 19 a generally inverted cup-shaped sheet metal dome-like member 90, having a lateral flange 91 and a central screw-threaded hole 92, is secured by spot-welding, soldering, crimping, or otherwise securing the flange 91 thereof to the follower plate 19. By engaging the screw 24 in the hole 92 the follower plate 19 may be held in an inoperative position against the lid 22 when the the device is not in use, as for instance, when the device is in storage or in transit. By unscrewing the screw 24, the follower plate 19 is released onto the top surface 51 of the fluid within the reservoir and at the same time a vent is formed through the raised dome part 23.

The follower plate 19 is preferably provided with pressed-up stiffening ribs 73, and an annular peripheral stiffening rib 74.

In order to prevent the lid from being loosened from the screw 24, by vibration while in transit or storage and during handling (either while the container is new and empty, or after it has been filled with grease but prior to ultimate use) and in order to keep the follower from turning when the screw 26 is turned in order to unscrew the lid, I provide a radial rib 75 pressed out from the conical portion of the dome-like projection 90 carried by the follower 19, or I may provide several such ribs circumferentially distributed about said dome 90. I then provide a similar rib or ribs 76 pressed outwardly from the conical portion of the vent-dome 23, into which the rib or ribs 75 are adapted to nest when the two conical portions of the dome 90 and 23 are held in telescopic or nested relation to each other by the tightening of the screw 24, as indicated in Figure 1.

By this means the lid 22 and the follower 19 are held against relative rotation at all times prior to the ultimate use of the device and during the loosening of the lid by the turning of the screw 24.

As the device is made up, the crimp flange 89 is not crimped into place about the bead 88, so that the lid 22, to which the follower 19 is then secured, may be removed from the body 5. The grease is then filled in to the body 5 and the lid superimposed and crimped in place in fluid-sealed relation, by use of the gasket 70.

If desired, however, the lid 22 may be initially permanently fastened to the body 5, and the grease filled into the container through the passage 48, merely by attaching a filling pipe to the socket 10 while the socket ring 15 is in the open position, and then turning the socket ring to the closed position and inserting the plug 87 into the ring. With this type of filling operation, the lid 22 may be permanently crimped to the upper part of the body 5 with a permanent crimped seam similar to the seam 11. In that event, however, the device would not readily be re-usable, because the lid could not readily be pried loose; whereas with the form of crimped flange shown for the lid 22, the lid may readily be pried loose by merely raising the pull tabs one at a time.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described the invention, what is hereby claimed as new and desired to be secured by Letters Patent, is:

1. A fluid-dispensing device suitable for filling grease-guns and the like and suitable for use as an original vendable merchandising packaging unit for containing more or less viscous greases and like fluids in transit and storage and for thereafter dispensing the same, including a generally upright reservoir body having side-wall, bottom and top; together forming a generally completely enclosed reservoir, a suction-receiving socket carried by said reservoir near the bottom thereof and being in communicable relation with the interior of said reservoir, a follower beneath said top and adapted to be secured to said top prior to the ultimate use of the device, co-axial fastening means for supporting said follower from said top, and means for locking said follower and said top relative to each other against relative rotation with respect to each other.

2. A fluid-dispensing device suitable for filling grease-guns and the like and suitable for use as an original vendable merchandising packaging unit for containing more or less viscous greases and like fluids in transit and storage and for thereafter dispensing the same, including a generally upright reservoir body having side-wall bottom and top; together forming a generally completely enclosed reservoir, a suction-receiving socket carried by said reservoir near the bottom thereof and being in communicable relation with

the interior of said reservoir, a follower beneath said top and adapted to be secured to said top prior to the ultimate use of the device, a vent dome extending upwardly from said top having an aperture therethrough, a corresponding projection carried by said follower and adapted to extend into said dome, a complementary projection and depression carried by said dome and said follower-projection and adapted to nest in each other when said vent dome and said follower projection are held in telescopic relation to each other, and a screw extending through the aperture in said vent dome and threadedly engaging said follower projection within said dome, for retaining the two in close proximity to each other.

3. A fluid-dispensing device suitable for filling grease-guns and the like and suitable for use as an original vendable merchandising packaging unit for containing more or less viscous greases and like fluids in transit and storage and for thereafter dispensing the same, including a generally upright reservoir body having side-wall, bottom and top; together forming a generally completely enclosed reservoir, a suction-receiving socket carried by said reservoir near the bottom thereof and being in communicable relation with the interior of said reservoir, a follower beneath said top and adapted to be secured to said top prior to the ultimate use of the device, an apertured vent dome extending upwardly from said top, a similar dome extending upwardly from said follower and adapted to telescope into said vent dome and having a screw-receiving opening therein in alignment with the aperture of said vent dome; said follower dome being fused to said follower and said follower being generally imperforate, and anti-rotational interlocking means for preventing relative rotation between follower and top when the former is held in close proximity to the latter by a screw extending through the aperture in said vent dome and threaded into the screw-receiving opening of said follower dome.

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